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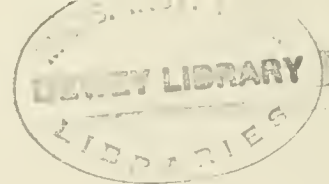




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YEARS OF SERVICE AND PROBABILITY OF PROMOTION

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## Abstract

This study provides evidence which we believe challenges some conventional assumptions about the promotion process. Based on survey information collected from a large random sample of U.S. private sector firms, we reach two main conclusions. First, seniority independent of productivity appears to play a significant role even in nonunion promotion decisions. Second, the differences between union and nonunion promotion processes, at least with regard to the weight assigned to seniority per se, appear to be important but less dramatic than is popularly supposed.



The relative weights afforded seniority and ability in the promotion process have been a long standing source of debate. At least within the economics profession, it is typically assumed that promotions in nonunion settings are awarded on a purely meritocratic basis. This assumption is consistent with the human capital view that the upward slope of the tenure/earnings profile should simply reflect the growth in employees' productivity with service.<sup>1/</sup> Though some would argue that promotions are most often awarded meritocratically even in union settings, the more widespread view is that unions restrict managements' ability to promote the most qualified candidate. Collective bargaining agreements which assign seniority a role in the promotion process are fairly common and case studies suggest that the weight actually given to seniority is often even greater than the terms of these provisions would suggest.<sup>2/</sup> The perception that unionization constrains managements' ability to promote as they please has contributed to the popular belief that union firms are less efficient than nonunion firms.

This paper presents data which we believe call into question the usual beliefs about how promotions are made. Based on survey information collected from a large random sample of U.S. firms, we reach two main conclusions. First, seniority independent of productivity appears to play a significant role even in nonunion promotion decisions. Second, the differences between union and nonunion promotion processes, at least with regard to the weight assigned to seniority, appear to be important but less dramatic than is popularly supposed.

Section I of this paper discusses what we can learn about

promotions from econometric analysis of company personnel records. Evidence concerning promotions based on two companies' personnel files are presented in Section II. Section III of the paper describes the survey on which our main conclusions rest. The data obtained from this survey are presented in Section IV. The paper's final section offers some concluding thoughts.

#### I. What Promotion History Data Can and Cannot Tell Us

Company personnel records contain the best available promotion history data for addressing the question of the role played by length of service in promotion decisions. However, unless these data sources contain "perfect" measures of individuals' relative capacities to perform in the job or jobs they might be promoted to, they cannot be used to estimate the "true" effect of seniority per se.

The following simple setup illustrates this fairly straightforward point. Suppose that we were able to identify a group of individuals who were starting out at some particular job level and that all these individuals faced similar promotion opportunities. Let the promotion process relevant for this group be captured by the following equation:

$$(1) P = \alpha + \beta S + \gamma C + \epsilon$$

where  $P$  equals 1 if a promotion has occurred and equals 0 otherwise,  $S$  represents years of service,  $C$  represents capacity to perform at the next level in the relevant job hierarchy and  $\epsilon$  represents the equation error (assumed to be orthogonal to  $S$  and  $C$ ).<sup>3/</sup> If it were possible to measure  $C$  perfectly, then  $\beta$  would give an unbiased estimate of the effect of seniority per se on advancement out of the

level under analysis. For heuristic purposes, assume to start that it is impossible to derive even a poorly-measured proxy for C and that as a result we must fit the following misspecified model:

$$(2) \quad P = \alpha' + \beta'S + \epsilon'$$

The expected value of the service coefficient in equation (2) is:

$$(3) \quad E(\hat{\beta}') = \beta + \gamma \cdot \frac{\text{cov}(S, C)}{\text{var } S}$$

Cov (S,C) has the same sign as the correlation between S and C; var S is always positive. If merit does in fact play an important role in the promotion process affecting the group under consideration ( $\gamma > 0$ ), so that the "best" employees in the level tend to be promoted, the within-group correlation between S and C should become negative ( $\text{cov}(S, C) < 0$ ). Thus, in this case,  $\hat{\beta}'$  will represent a downward-biased estimate of the true effect of length of service on likelihood of advancement. Even if longer service improves one's promotion prospects ( $\beta > 0$ ), a negative estimated length-of-service coefficient could easily be obtained. Only if merit plays no role in the promotion process ( $\gamma = 0$ ) will  $\hat{\beta}'$  represent an unbiased estimate of the true effect of length of service on probability of promotion.

Company personnel records do sometimes contain measures, albeit imprecise, of individuals' likely success on the job or jobs they might be promoted to. Suppose that an imperfect measure of capacity to perform in the next job or later jobs can be obtained:

$$(4) \quad M = C + \zeta$$

where M is the available measure, C represents true capacity to perform in the next job or later jobs, and  $\zeta$  is the error term. If M were introduced into the simple promotion model of equation (1) in

lieu of C:

$$(5) P = \alpha + \beta S + \gamma M + \epsilon$$

the expected value of the length of service coefficient would be:

$$(6) E(\hat{\beta}) = \beta + \frac{\gamma \text{cov}(S, C) \text{var } \zeta}{\text{var } S \text{var } C - \text{cov}(S, C)^2 + \text{var } S \text{var } \zeta}$$

Comparison of (6), which shows the service coefficient bias in a promotion equation which includes an imperfect measure of potential, against (3), which shows the service coefficient bias in a promotion equation with no potential measure, reveals that the introduction of the imperfect potential measure should reduce but not eliminate any downward bias initially present in the service coefficient (since it can be shown that  $(\text{var } \zeta / (\text{var } S \text{var } C - \text{cov}(S, C)^2 + \text{var } S \text{var } \zeta))$  is less than  $1/\text{var } S$ ).

In principle, it might seem that the lack of direct measures of individuals' differing capacities could be dealt with by using more sophisticated longitudinal econometric models of the promotion process. In practice, this approach is unlikely to be satisfactory. Assume, as before, that the promotion process in year  $t$  can be represented by the following equation:

$$(7) P_t = \alpha + \beta S_t + \gamma C + \epsilon_t$$

where  $P_t$  equals 1 if a promotion occurs in year  $t$  and equals 0 otherwise,  $S_t$  represents length of service as of the start of year  $t$ ,  $C$  represents capacity to perform at the next level of the relevant job hierarchy (assumed to be stable over time) and  $\epsilon_t$  represents the equation error (assumed to be orthogonal to  $S_t$  and  $C$ ). If  $\alpha$ ,  $\beta$  and  $\gamma$  were fixed over time and two years of promotion data were available, the following equation could be estimated:

$$(8) P_{t+1} - P_t = \beta (S_{t+1} - S_t) + (\epsilon_{t+1} - \epsilon_t).$$

Note that  $S_{t+1} - S_t$  will always equal one; since there is no



variation in  $S_{t+1} - S_t$ , the model reduces to an equation with just a constant term. In effect, then, this procedure can yield a reliable estimate of the effect of length of service on probability of promotion only if we are confident that  $\alpha$  is in fact fixed over time; any changes in  $\alpha$ , such as might be associated with faster or slower corporate growth leading to a higher or lower overall promotion rate, will contaminate the estimated value of  $\beta$ . There is no obvious way to escape this problem.

The preceding discussion implies that cross-sectional analysis of a company's personnel data can give us a partial picture of the respective roles played by seniority and merit in the promotion process at that firm. First, a negative service coefficient in a simple promotions equation suggests that merit may be very important in the promotion process. A negative service coefficient could also reflect discrimination against senior employees in advancement decisions, though it certainly does not prove that such discrimination exists. If a negative service coefficient is attributable to the strongly meritocratic nature of a promotion system, the addition of performance or potential measures to the promotion equation should move the estimated length of service coefficient towards zero. Second, a positive service coefficient in a simple promotion equation indicates that seniority plays an important role in the promotion process, though it does not establish that merit is unimportant. If seniority per se is the only factor affecting promotions, the addition of performance or potential variables to the equation should not affect the length of service coefficient.<sup>4/</sup>

## II. Analysis Of Actual Promotions Data

In this section of the paper, we present and discuss evidence

concerning the relationship of company service and rated performance to the probability of being promoted among one group of white male exempt employees, for whom information on potential exists, and among a second group of unionized hourly employees, for whom an objective measure of productivity is available.

#### Results for Sample Of Nonunion Salaried Employees

The first data set we will look at contains information for the white male exempt employees of a large U.S. manufacturing corporation which we will refer to as Company C.<sup>5/</sup> Exempt positions at Company C are grouped into salary grade levels; we define a promotion as a move from any salary grade to a higher salary grade level.

Company C computerized personnel records contain a considerable amount of information on each of its exempt employees. We were able to get a fix on each employee who was with the company as of each year end from 1973 through 1978. These data enabled us to estimate five sets of promotion equations, one each for 1973-1974, 1974-1975, 1975-1976, 1976-1977 and 1977-1978. The information available on each employee included education, age (used to construct a pre-company experience proxy), length of service, region where employed, race and sex. As stated above, we restricted our analysis to white males. The personnel records also contained annual performance ratings and an annual assessment of potential for each employee. The performance rating is assigned based upon the consensus of all the supervisors in an area and measures how well an employee is fulfilling the responsibilities of his position. The potential rating represents the immediate supervisor's assessment of the highest grade level an employee can be expected to reach in the course of his career with Company C. This variable was made continuous by assigning to each individual the 1977 mean salary for white

males in the grade level which he was expected to attain.

Table 1 reports the 1977-1978 promotion equations we estimated using the Company C data; very similar results were obtained with each of the other year's data. The model in column (1) includes controls for education, pre-company experience, region and grade level in addition to company service. As would be expected in a meritocratic system, length of service bears a strong negative relationship to probability of promotion. At the overall sample means, an additional year of service is associated with a .005 or 4 percent lower probability of being promoted. Can this lower probability be attributed simply to discrimination against senior employees? The models presented in columns (2), (3) and (4) suggest that it cannot be. The model in column (2) adds performance rating dummies to the model reported in column (1). While good performance at one level of the managerial hierarchy does not necessarily imply success at the next level, the two should be positively correlated. As expected, the introduction of the performance rating dummies into the promotion equation moves the estimated seniority coefficient towards zero. The model (2) coefficients imply that, at the overall sample means, an additional year of service is associated with a .003 or 2 percent lower probability of being promoted. One could argue that the potential assessments mentioned above are a better measure of employees' likely success in the next higher grade level than the performance ratings. These are introduced in model (3). With this model's estimated coefficients, at the overall sample means, service has virtually no association with the probability of being promoted. Finally, model (4) includes both the rated performance dummies and the rated potential variable. While the two ratings are related, each has

Table 1: Promotion Equations for Company C's Exempt Employees

Dependent Variable = 1 If Promoted  
Between January 1 and December 31, 1978,  
0 Otherwise

	Mean [Standard Deviation]	(N = 7,381)			
		1	2	3	4
Years of Company Service/10	1.954 [1.109]	-.961 (.130)	-.795 (.133)	.174 (.151)	.011 (.152)
(Years of Company Service) <sup>2</sup> /100	5.048 [4.386]	.116 (.034)	.129 (.035)	-.045 (.037)	.003 (.037)
Performance rating 1 (worst; yes = 1)	.002 [.048]	-	-.427 (1.053)	-	-.181 (1.039)
Performance rating 2 (yes = 1)	.123 [.329]	-	-.250 (.170)	-	-.195 (.170)
Performance rating 4 (yes = 1)	.261 [.439]	-	.564 (.110)	-	.436 (.110)
Performance rating 5 (yes = 1)	.265 [.442]	-	1.137 (.105)	-	.793 (.110)
Performance rating 6 (best; yes = 1)	.095 [.293]	-	1.575 (.126)	-	.896 (.142)
Ln (mean salary in potentially highest grade)	10.421 [.318]	-	-	3.612 (.215)	2.782 (.239)
Education dummies (4)	-	yes	yes	yes	yes
Pre-company experience and its square	-	yes	yes	yes	yes
Grade level dummies (11)	-	yes	yes	yes	yes
Constant	-	yes	yes	yes	yes
$\chi^2$	-	4321.31	4569.80	4638.03	4714.10
d.f.	-	19	24	20	25

a. Equations were estimated using a maximum likelihood logit procedure. Individuals in grade levels where either everyone or no one received a promotion were excluded from the logit samples. The mean (standard deviation) of the dependent variable is .167 [.373]. All independent variables are as of December 31, 1977.

Note: Standard errors are enclosed in parentheses below the coefficient estimates.



its own sizable relationship with chance of promotion. With both ratings held constant, one more year of service is associated with a .0003 or .2 percent higher promotion probability.

These results for Company C's white male managers and professionals match those predicted for a regime where promotions are awarded meritocratically. The estimated length of service coefficient in the promotion equation with no performance or potential measure is negative; the introduction of the performance measure moves the service coefficient towards zero and the introduction of the potential measure actually moves it through zero.<sup>6/</sup>

#### Results For Sample Of Union Hourly Employees

Extending work done previously by Robert H. Yanker, we have also examined data related to the promotion process for unionized hourly blue collar employees at a U.S. manufacturing firm which we will refer to as Company G.<sup>7/</sup> Among this group of employees, job movements occur through a posting and bidding system. When there is a job opening, a notice which describes the position and specifies its wage is posted on all factory bulletin boards. Any employee can then file a bid for the posted job; on the bid, the employee gives his or her seniority date and outlines why he or she is qualified for the job in question. The General Foreman of the company reviews all of the bids and determines who is to be given the job. The collective bargaining agreement covering these employees states that the selection is to be based on "plant wide seniority provided the individual is qualified." The agreement further specifies that:

Qualified for a job opening. . . means that an employee has the basic knowledge required for a job opening and/or has demonstrated by working on a similar, though perhaps

lower rated, job that he has the ability to perform the job involved.

Company G keeps track of all jobs that are posted, including the name of the successful bidder and the names of all unsuccessful bidders. We have studied all of the bids which occurred between January 1, 1979 and July 1, 1979. Information on years of service and productivity could be obtained for 377 hourly employees at the company. The productivity index deserves more explanation. Each job that a worker does has a certain amount of time considered standard for its completion. The standard times are initially based on engineering estimates and are then tested in the shop; in this study, we use only production ratings based on tested standards. Production ratings for each worker were derived as standard time divided by actual time to complete the job. A final piece of information taken from the personnel records was each employee's department; this was needed because the different departments have different average productivity ratings. For this reason, productivity indices equal to an individual's production rating divided by his or her department's mean rating were calculated and used in the investigation to be summarized.

At Company G during the 6 months under analysis, information existed on 125 bid groups in which a worker was awarded a posted job. Because of the way advancement up the job hierarchy occurs among the production workers at Company G, there was much less dispersion in years of service among those bidding for a job than among the work force as a whole; those seeking advancement were primarily low service employees at the bottom of the job pyramid. Averaging across the 125 bid groups, we find a standard

deviation of years of service equal to 1.48 and a mean service of 3.71, whereas in the entire sample of 377 individuals the comparable figures are 9.13 and 8.27. Averaging across bid groups reveals that the standard deviation and mean in productivity within bid groups was much closer to what was observed for the sample as a whole; within bid groups the productivity standard deviation and mean were .22 and 1.03, whereas in the entire sample they were .30 and 1.00. The productivity statistics are what might be expected in a promotion system where merit played a very secondary role to seniority per se in determining advancement.

Who won the bids? In 97 percent of the cases it was the bidder with the greatest service. Was the senior winner also the most productive? This seems to have been the case only by chance; in 52 percent of the bid groups the most senior worker who won the bid competition had the highest production index, whereas in 48 percent he or she was dominated in terms of productivity.

A full analysis of the advancement process at Company G cannot be conducted, since data do not exist to place workers in the same or comparable jobs at the beginning of the period under analysis. However, our investigation of the bidding process reveals the very important role of years of service in a promotion procedure which relies on posting and bidding and is governed by a union contract.

#### Conclusions from the Company Personnel Data

Our analysis of personnel records for Company C's managerial and professional employees strongly suggests that, as might have been expected, their promotions are based principally on merit, not seniority. In contrast, seniority alone seems to determine

promotions among hourly union workers at Company G. Unfortunately, these results only tell us about the promotions process in these two settings. Drawing any strong general conclusions from these two examples would be risky, since there may well be considerable diversity of practice concerning promotions even within a category of workers.

One possible approach to creating a broader and more precise picture of how promotion decisions are made would have been to gather and analyze personnel records for a large number of firms. An alternative approach involves surveying a large number of managers concerning decisions at their firms.<sup>8/</sup> This research strategy seemed to us more cost effective and was the one adopted. One key drawback to relying on managers' reports of how promotion decisions are made is that they may misperceive the way the process operates. In this connection, it is reassuring to note that when we talked with individuals at the firms whose personnel records we had been able to analyze, what they told us matched the interpretation coming out of the data.<sup>9/</sup>

### III. Collection of the Survey Data

The data on which this paper's central conclusions rest were obtained from a mail survey which asked a fairly large sample of employers both about formal policies governing seniority's role in the promotion process and, more importantly, about the role played by seniority in actual promotion decisions.

We sent our survey to 1025 randomly selected nonagricultural, nonconstruction firms from the 1981 edition of Standard and Poor's



Register.<sup>10/</sup> Firms based outside the U.S. were excluded from the sample. Standard and Poor's generally lists companies with 50 plus employees and \$1,000,000 plus in sales in their Register; these companies represent perhaps two-thirds of total U.S. nonagricultural, nonconstruction employment.<sup>11/</sup>

Whenever possible, we mailed our survey to that individual at each firm who appeared to be in charge of personnel matters (e.g., the Executive Vice-President of Personnel, the Personnel Director or the Industrial Relations Vice-President). In cases where no such individual's name could be obtained, the letter was sent to the Chief Executive Officer of the corporation. The original letter was dated August 15, 1981. If no response was received from a firm within six weeks after our first request was mailed, a second request was sent to the original contact. Altogether, we received 429 responses (a response rate of 42 percent). Because of various data problems, there were somewhat fewer usable responses.

A question at the start of the survey form asked how many exempt employees (most likely managers and/or professionals), nonexempt salaried employees and hourly employees were affected by the respondent's personnel decisions; all subsequent answers refer to the largest of these subordinate groups. One of the later questionnaire items inquired whether a majority of those in the relevant group were covered by a collective bargaining agreement. In the analysis which follows, we look separately at three response categories: union hourly employees; nonunion hourly employees; and nonunion salaried employees (nonexempt and exempt combined).<sup>12/</sup>

Much previous work on the role played by seniority in promotion decisions has focused on collective bargaining agreement provisions. We asked whether either a collective bargaining agreement or a written policy dealing explicitly with the role of seniority in promotion decisions covered the group of employees referred to by each respondent. Where we were told that such an agreement or policy did exist, we asked whether the relevant language stated that seniority should be the single most important factor in determining who would be promoted.

Our primary objective was to learn more about actual practice concerning the role of seniority in promotion decisions. To this end, respondents were asked the following question:

In actual practice, are junior employees promoted instead of more senior employees who want the job?

☐ Yes, if it is believed that the junior employee will do better than the senior employee on the next job or on later jobs.

☐ Yes, if it is believed that the junior employee will do significantly better than the senior employee on the next job or on later jobs.

☐ No, never.

This question produces the most important information in our data set for exploring the issue at hand. The responses indicate the strength of the preference for senior employees when promotions occur.<sup>13/</sup>

#### IV. Survey Results

The data from our survey provide evidence both on formal policies and on actual practice concerning seniority's role in the promotion process.

## Written Promotion Provisions Covering Various Groups

Table 2 summarizes the content of written policy provisions governing promotions as reported by our survey respondents.

The first things to note are that very few nonunion employees are covered by written provisions which specify seniority's role in the promotions process and that even fewer are covered by written provisions which assign seniority a determining role in that process. Fewer than 5 percent of our nonunion hourly respondents and none of our salaried nonunion respondents indicated the presence of a written policy clause stating that seniority should be the most important factor in promotion decisions.

In contrast, a large majority (85 percent) of our union hourly respondents reported provisions specifying seniority's role in promotion decisions and almost half (48 percent) of those reporting such provisions said they made seniority the key factor determining who gets promoted. Thus, just over 40 percent of our union hourly respondents reported coverage by written provisions making length of service the primary factor in promotion decisions.

We know of no other comparable data on written promotions provisions covering nonunion employees. Our 40 percent figure for union hourly employees is somewhat larger than that produced by a Bureau of Labor Statistics study of 1967-1968 major collective bargaining agreements, in which only 29 percent of contracts had a provision specifying seniority to be either the "sole factor" or the "primary factor" in promotions.<sup>14/</sup> However, our figure agrees well with that produced by a more recent Bureau of National Affairs study of 400 representative collective bargaining agreements, in which 45 percent of the contracts specified seniority to be either the "sole factor" or the "determining factor" in promotions.<sup>15/</sup>

Table 2: Contract and Written Policy

Provisions Governing Promotions

	<u>Employee Type</u>		
	<u>Hourly Union</u>	<u>Hourly Nonunion</u>	<u>Salaried Nonunion</u>
Proportion for which contract or written policy specifies role of seniority in promotion decisions (P)	.851	.244	.070
Given a contract or written policy which specifies seniority's role, proportion for which relevant language states seniority to be most important factor in promotion decisions (SMI)	.483	.132	.000
Proportion for which language in a contract or written policy states seniority to be most important factor in promotion decisions (P x SMI)	.410	.032	.000
Number of observations on which above proportions based	134	156	100

Based solely on the terms of the relevant written provisions, then, one might be tempted to conclude that almost no nonunion hourly employees or nonunion salaried employees but a substantial minority of union hourly employees worked in settings where length of service had an important independent effect on promotion decisions. Overall, assuming that seniority plays a role in promotion decisions only insofar as specified in written policy or collective bargaining agreement clauses, a very rough estimate based on our survey responses would be that 8 percent of our county's private sector, nonagricultural, nonconstruction employees work in settings where seniority plays an important role in the promotion process.<sup>16,17/</sup>

#### Actual Practice Concerning Promotions

The answers we received to our question on the role actually played by seniority in promotion decisions suggest that these conclusions would be seriously in error.

As reported in Table 3, over half (56 percent) of our nonunion hourly responses and over half (57 percent) of our salaried nonunion responses indicated that in practice senior employees are afforded substantial preference in advancement (meaning either that a junior employee would never be promoted ahead of a senior employee or that a junior employee would be promoted ahead of a senior employee only if expected to perform significantly better on the next job or on later jobs). Thus, seniority seems to matter for many nonunion promotion decisions even though there are few written provisions specifying that it should.



Comparing union hourly and nonunion hourly responses, the union figures show both a higher total percentage of cases where senior employees receive substantial preference (76 percent versus 56 percent) and a higher percentage of cases where a senior employee would never lose out to a junior competitor (33 percent versus 15 percent). The implicit advancement rights afforded to senior employees do seem to be both more prevalent and stronger for union hourly than for nonunion hourly work groups. Though these union/nonunion differences are substantial and statistically significant, it is noteworthy that they are not quite so pronounced as the differences in the terms of relevant written provisions discussed above.

While we know of no other data that permit the independent effect of seniority on promotions to be identified in quite the way our data do, two interesting new interview studies have produced results that seem consistent with our findings. Edwin Dean reports interview data pertaining to promotions of hourly workers at a fairly broad, though not strictly random, sample of 134 union establishments and 47 nonunion establishments. At 70 percent of the union establishments and at 43 percent of the nonunion establishments in Dean's sample, seniority was ranked the first or second most important selection criterion in promotion (the other choices being written tests, written performance evaluations, interviews, educational qualifications, prior related work experience and supervisors' recommendations).<sup>18/</sup> Quinn Mills obtained interview data pertaining to 248 actual promotion decisions at a randomly selected sample of firms. While his study focused primarily on the

Table 3: Actual Practice Concerning the Role of  
Seniority in Promotion Decisions

	<u>Hourly Union</u>	<u>Employee Type Hourly Nonunion</u>	<u>Salaried Nonunion</u>
Proportion reporting that junior employees never promoted ahead of senior employees	.333	.146	.120
Proportion reporting that junior employees promoted ahead of senior employees only if they are expected to perform <u>significantly</u> better on the next job or on later jobs	.430	.411	.450
Proportion reporting that junior employees promoted ahead of senior employees if they are expected to perform better on the next job or on later jobs	.237	.443	.430
Number of observations on which above proportions based	135	158	100

effect of job posting on promotion decisions, he does conclude that "a very substantial minority of senior persons are promoted over better-performing junior persons."<sup>19/</sup>

Based on what our respondents had to say about actual practice, then, we estimate that over half of both nonunion hourly employees and nonunion salaried employees and over three quarters of union hourly employees work in settings where length of service has an important independent role in the promotion process. Overall, among perhaps 60 percent of our country's private sector, nonagricultural, nonconstruction employees, senior individuals are afforded substantial preference in advancement.<sup>20,21/</sup>

## V. Conclusions

The results reported in this paper have some important implications. First, our finding that perhaps 60% of U.S. employees work in settings where seniority leads to substantial preference in promotion decisions seems inconsistent with the human capital view that upward sloping tenure/earnings profiles necessarily reflect upward sloping tenure/productivity profiles. In earlier work, we have argued that none of the rather substantial within-job earnings increment associated with seniority reflects a corresponding within-job productivity increment; this increment must be considered a return to seniority per se.<sup>22/</sup> These new results suggest that, for a substantial part of the U.S. workforce, the earnings advantage enjoyed by longer service employees because they hold higher level jobs must also be considered at least partly a return to seniority independent of performance. Second, while our findings indicate that



length of service carries greater weight in the typical union hourly promotion decision than in the typical nonunion hourly promotion decision, this difference is less pronounced than one might have expected based on an examination of written provisions covering the two groups. For both nonunion and union employee groups, actual practice regarding promotions seems to give more weight to length of service than required by the terms of any written provisions. The discrepancy between practice and policy is more marked for nonunion employee groups. The seniority-based promotion rules prevalent in union environments are often pointed to as an important cause of inflexibility and reduced productivity in those settings. While such seniority-based rules are certainly applied both more often and more rigidly in union plants than in nonunion plants, these are differences of degree rather than differences of kind. Even in the absence of a union, managers are often not completely free to promote the candidate expected to perform best on the new job. Even in the presence of a union, management usually can avoid making a promotion which would have very deleterious productivity effects.

Several major questions remain unanswered by our research in this area to date. What explains the diversity in promotion practices across firms? How do these promotion practices fit into the larger web of personnel practices at these firms? Why do so many firms give such substantial weight to length of service per se in rewarding promotions? Why do they give service per se still more weight in termination discussions?<sup>23/</sup> All of these questions suggest possible directions for future explorations.

## FOOTNOTES

1. Becker [1975, pp. 16-37] lays out the basic human capital model of on-the-job training. Mincer [1974, pp. 80-83] focuses specifically on the promotion process; he argues that, even in the union sector, promotions are most often awarded primarily on the basis of merit rather than on the basis of seniority.
2. See U.S. Department of Labor [1970, pp. 36-37] and Bureau of National Affairs [1983, p. E1] for summaries of promotion provisions found in two samples of collective bargaining agreements. Slichter, Healy and Livernash [1960, pp. 178-210] offers a classic discussion of how actual promotion practices may diverge from contract language.
3. One would actually want to estimate a logit or a probit equation rather than an ordinary least squares regression, but the bias argument made here in terms of an ordinary least squares regression should be qualitatively correct.
4. We have discussed the interpretation of promotion equation estimates for a group of employees who all are covered by the same internal labor market rules. Analyzing an individual panel data set which contains information on promotions, such as the Quality of Employment Survey (QES) panel or the Panel Study of Income Dynamics (PSID), would be much less satisfactory. The basic problem is that the individual observations come from many different occupational groups and from many different firms. Even if the observations for different categories of employees (e.g. union hourly employees, nonunion hourly employees and salaried employees) were treated

separately, the observed pattern of promotions would represent the outcome of many separate -- and possibly quite different -- processes. At best, analysis of individual panel data could reveal something about the average promotion process affecting workers of a given type; it could never tell us anything about the distribution of promotion practices. It would in fact be risky even to use individual panel data to support conclusions about the average promotion process affecting a category of workers. For example, a negative length of service coefficient in a promotion equation could reflect either the meritocratic nature of the average promotion process affecting those in the relevant category or simply a concentration of long service employees in slow-growth firms where there are few promotion opportunities. Furthermore, what constitutes a promotion may vary greatly from setting to setting. There is also no way to compare the likely performance in possible next jobs of the various individuals in a panel data set. Comparison of promotion equation estimates across categories of workers would be plagued by the same sort of difficulties. Olson and Berger [1982] report the results of a promotion analysis based on the QES panel and also offer an insightful discussion of many of the potential problems with their approach.

5. A more detailed description of this data set and related estimates can be found in Medoff and Abraham [1981].
6. We also estimated models like those in column (1) and column (2) using data for another firm's white male exempt employees. See the discussion pertaining to Company B in Medoff and Abraham [1980] for a detailed description of this data set. As

with the Company C data, the promotion equation with no performance rating dummies produced a negative and strongly significant service effect. Introducing the performance rating dummies moved the service effect towards zero, though the shift was much less pronounced than in the Company C data. The Company B results are not reported in the text because they exhibit basically the same pattern as the Company C results, but they can be supplied by the authors upon request.

7. See Yanker [1980] for a more detailed discussion of these data and some related estimates.
8. We ruled out using the QES panel or the PSID because of the problems with analyzing individual panel data on promotions discussed in footnote 4. Basically, the firm, not the individual, is the appropriate unit of analysis for studying promotions.
9. This was true at Company B (the firm mentioned in footnote 6), as well as at Company C and Company G (the firms for which results are reported in the text).
10. The same questionnaire was also sent to 250 randomly selected manufacturing firms from a 1980 News Front listing. We oversampled manufacturing because our survey contained questions on layoffs in addition to the questions on promotions used in this paper and we wanted to secure responses from a reasonable number of companies that had experienced workforce reductions. In this paper, we chose to focus on our Standard and Poor's responses because we felt they should be more representative of the economy as a whole.
11. Tabulations based on the May 1979 Current Population Survey

show that 56 percent of those whose primary employment was in the nonagricultural, nonconstruction private sector said they worked for companies with 100 plus employees and 70 percent said they worked for companies with 25 plus employees. Data from the ES-202 program indicate that unemployment insurance reporting units with 50 or more employees account for 64 percent of total covered private sector employment outside agriculture and construction; since firms may contain more than one unemployment insurance reporting unit, firms with 50 or more employees should account for some larger fraction of covered employment in the relevant sectors.

12. There were a very small number of responses pertaining to unionized salaried employees which were excluded from the sample we used for analysis.
13. In addition to the questions described in the text, we also asked about the total employment, product mix and location of each firm in our sample. This information was used in some sensitivity analyses.
14. See U.S. Department of Labor [1970, pp. 36-37].
15. See Bureau of National Affairs [1983, p. E1].
16. One concern we had about the results reported in Table 2 was that they might be contaminated by nonresponse bias. To check whether this was a problem, we prepared separate tabulations for early responders (those who replied to our original mailing) versus late responders (those who replied only after receiving our followup letter) and then checked for differences between the two groups' answers. Among both the union hourly and the nonunion hourly replies, early responders were



significantly more likely than late responders to report the existence of a written provision specifying seniority's role in promotion (.895 versus .766 for the union hourly implies and .311 versus .115 for the nonunion hourly replies). These were the only significant early/late differences we found. The qualitative conclusions derived from either the early responses alone or the late responses alone are the same as those derived from Table 2. We also looked at two sets of weighted tabulations, one which corrected for differing response rates across nine firm size/industry cells and a second which used CPS employment weights for the same firm size/industry cells. Both of these sets of numbers were very similar to those reported in Table 2.

17. This very rough estimate was obtained by weighting the estimates for union hourly employees, nonunion hourly employees and salaried employees by the fractions of private sector, nonagricultural, nonconstruction employment in each of these same three groups. The employment figures were derived from the May 1978 Current Population Survey (CPS): union members paid by the hour, 17 percent; nonmembers paid by the hour, 43 percent; and nonhourly employees, 40 percent, of which 8 percent were union and 92 percent were nonunion. There was no way to distinguish nonexempt and exempt salaried employment on the CPS.
18. See Dean [1982]. The numbers we cite are not reported in Dean's paper but can be derived from those he does report.
19. See Mills [1982].

20. As with our Table 2 results, we were concerned that the numbers reported in Table 3 might be contaminated by nonresponse bias. We again prepared separate tabulations for early versus late responders. The distribution of early union hourly responses was significantly different from the distribution of late union hourly responses, with the late distribution including a higher proportion of answers at one extreme or the other. However, once again, the qualitative conclusions derivable from either the early responses alone or the late responses alone are no different than those derived from the figures we report. We also prepared two sets of weighted tabulations like those reported in Table 3, one of which corrected for response rate variation across nine firm size/industry cells and a second which used CPS employment weights for the same firm size/industry cells. The results were in both cases very similar to those we report.
21. The 60 percent figure was derived in the fashion described in footnote 17.
22. See Medoff and Abraham [1980] and Medoff and Abraham [1981].
23. See Abraham and Medoff [1983].

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